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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/622,147	10/30/2000	Mohammed Javed Absar	851663414USP	8294

7590 03/24/2006

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EXAMINER
FLANDERS, ANDREW C

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 03/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/622,147	Applicant(s) ABSAR ET AL.	
	Examiner Andrew C. Flanders	Art Unit 2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *13 January 2006*.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-6,9-20,23-34 and 36-66* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-6,9-20,23-34 and 36-66* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☒ All b) ☐ Some * c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 13 October 2005 has been entered.

Response to Arguments

Applicant's arguments filed 13 October 2005 have been fully considered but they are not persuasive.

Applicant Alleges:

> "In contrast to claim 1, Castelaz is directed to a neural network signal processor that can "learn" algorithms required for identification of features received directly from input sensor signals. Castelaz states that "the NSP is a feature extraction and pattern recognition device that can accept raw sensor signals as input and identify targets signatures by using features and algorithms it has previously learned by example." (See col. 2, lines 43-47.) The "extraction of features" that the Examiner says is disclosed in Castelaz (see col. 1, lines 22-24) is nothing more than recognizing signal measurements such as pulse width, amplitude, rise and fall times, frequency, etc. There is no "extraction" taking place in the neural signal processor of Castelaz. Rather, recognition of patterns in an incoming signal and matching of the same with learned patterns is the function of the neural processor of Castelaz.

Examiner respectfully disagrees with this allegation. Applicant is primarily arguing that there is no feature "extraction" taking place. However, in the exact passage quoted by Applicant states "the NSP is a **<u>feature extraction</u>** and pattern recognition device...". Examiner is unsure of the logic used by Applicant in this situation. Applicant submits that there is no feature extraction, yet the prior art, and the cited text by Applicant define the NSP as a feature extraction device. If the Applicant wishes to uphold this argument, further clarification is respectfully requested.

Applicant further alleges:

> "In the passage quoted by the Examiner that refers to a "typical" neural net model, Castelaz was describing the learning procedure for the NSP in which differences between an actual and a desired output are minimized. There is no teaching or suggestion of determining a first variation of exponent values within a first exponent set and determining a second variation of exponent values between the first exponent set and subsequent exponent sets and in which a first neural layer computes weighted sums of its inputs and a second neural layer determines a coding strategy for a selected output of the first neural layer. Moreover, there is no teaching or suggestion in the ATSC reference of these steps."

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. In the instant case, Applicant is alleging that there is not teaching of:

"determining a first variation of exponent values within a first exponent set and determining a second variation of exponent values between the first exponent set and subsequent exponent sets and in which a first neural layer computes weighted sums of

its inputs and a second neural layer determines a coding strategy for a selected output of the first neural layer"

However, when taken in combination with the ATSC, as done in the rejection, these elements are disclosed, as shown in the rejection.

See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant further alleges:

> "Claim 17 is directed to a method for coding audio data having a sequence of exponent sets. A first variation is determined using neural network processing in order to determine the maximum number of exponent sets that are similar to a given exponent set, the neural network processing having first and second layers in Which the first layer computes weighted sums of its inputs to determine the first variation and the second neural layer that determines the coding strategy for a selected output from the first neural layer. "
>
> "As discussed above with respect to claim 1, nowhere do ATSC or Castelaz teach or suggest these steps, and in particular determining the maximum number of similar exponent sets. In addition, the combination of Castelaz and ATSC does not teach or suggest the combination of steps recited in claim 17 for the reasons discussed above with respect to claim 1."

Examiner respectfully disagrees with this allegations for the same reasons stated above regarding the arguments as to claim 1. Further, the limitation of

Applicant's arguments regarding claims 31 and 45 are not persuasive for the same reasoning discussed above regarding the arguments as to claims 1 and 17.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims1 – 6, 9 – 20, 23 – 34, 36 – 66 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

To contain statutory subject matter a claim must satisfy section 101 requirements; i.e. the claim must be for a practical application of the § 101 judicial exception, which can be identified in various ways:

1. The claimed invention "transforms" an article or physical object to a different state or thing.

2. The claimed invention otherwise produces a useful, concrete and tangible result, based on the factors discussed below.

It is submitted that the claimed invention in the independent claims do not transform an article or physical object to a different state or thing. The claims also do not produce a useful, concrete and tangible result. The claims merely appear to calculate exponents and choose a coding strategy accordingly. No coding is taking place and no output appears to be produced.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 – 6, 9 – 11, 17 – 20, 23 – 25, 31 – 34 and 45 – 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over ATSC in view of Castelaz (U.S. Patent 5,003,490).

Regarding **Claim 1**, ATSC discloses:

A method for processing data in an audio data encoder, the data including a sequence of exponent sets each comprising a plurality of exponents (page 103), the method comprising the steps of:

determining a first variation of exponent values within a first exponent set (i.e.for each audio channel, examining the variation in exponents over frequency and time; page 103)

determining a second variation of exponent values between said first exponent set and each subsequent exponent set in said sequence (i.e. differential coding in which the exponents for a channel are differentially coded across frequency and successive exponents are sent as differential values which must be added to the prior exponent value in order to form the next absolute value);

computing weighted sums of inputs to determine the first variation (i.e. when the variation exceeds a threshold, new exponents will be sent; page 103 8.28. To

determine if the threshold is exceeded a difference calculation must be done. When calculating the difference between two elements for example B and A, B – A provides that result. B-A is mathematically equivalent to (1)B + (-1)A which includes weighted sums. Calculating this equation thus computes weighted sums.)

determining a coding strategy for a selected output from the (computed weighted sums) (i.e. it is then determined if strategies D15, D25 or D45 are used);

assigning an exponent coding strategy to the first exponent set based on the determined first and second variations (i.e. and the differential exponents are combined into groups in the audio block and the grouping is done by one of three methods D15, D25 or 045 which are referred to as exponent strategies; section 7.1 .1 page 45)

ATSC does not disclose that the steps of determining the first and second variations are performed utilizing neural network processing, the neural network processing having first and second neural layers, the first neural layer computing weighted sums of its inputs to determine the first variation, and the second neural layer determining a coding strategy for a selected output from the first neural layer.

Castelaz discloses a neural network signal processor that can receive and analyze raw audio data (col. 2 lines 38 - 47) and the neural signal processor comprises a layer of input processing units connected to other layers of similar neurons (col. 2 lines 49 - 50).

Modifying the encoder taught by ATSC to operate as a neural network as taught by Castelaz would create an encoder with the steps of determining the first and second variations are performed utilizing neural network processing, the neural network

processing having first and second neural layers, the first neural layer computing weighted sums of its inputs to determine the first variation, and the second neural layer determining a coding strategy for a selected output from the first neural layer.

Multiple level processing such as neural network processing is notoriously well known in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the teachings of Castelaz to function as the determining process of ATSC. One would have been motivated to do so to reduce preprocessing required; see Castelaz col. 2 lines 30 – 35.

Regarding **Claims 2 and 45**, in addition to the elements stated above regarding claim 1, the combination further discloses:

wherein the exponent coding strategy is assigned from a plurality of exponent coding strategies having different differential coding limits (i.e. ATSC further discloses the differential exponents are combined into groups in the audio block and the grouping is done by one of three methods D15, D25 or D45 which are referred to as exponent strategies and the number of exponents in each group depends only on the exponent strategy; section 7.1.1 page 45)

Regarding **Claims 3 and 46**, in addition to the elements stated above regarding claim 2, the combination further discloses:

a step of coding said first exponent set according to the assigned exponent coding strategy (ATSC discloses combining the differential exponents into groups done by three methods which are referred to as exponent strategies; section 7.1 .1 page 45)

Regarding **Claim 4**, in addition to the elements stated above regarding claim 3, the combination further discloses:

a step of coding said first exponent coding strategy to at least one subsequent exponent set based on the corresponding determined second variation (i.e. ATSC further discloses looking at the variation of exponents over time and when the variation exceeds a threshold, new exponents will be sent; section 8.2.8 page 103).

Regarding **Claim 5**, in addition to the elements stated above regarding claim 4, the combination further discloses:

wherein the plurality of exponent coding strategies includes an exponent set re-use strategy that is assigned to the at least one subsequent exponent set (ATSC further discloses that if the spectrum changes little over the 6 blocks in a frame the exponents will be reused for blocks 1 –5; section 8.28 page 103)

Regarding **Claim 6**, in addition to the elements stated above regarding claim 5. the combination further discloses:

comprising a step of coding said first exponent set and said at least one subsequent exponent set according to the corresponding assigned coding strategies

(ATSC further discloses looking at the variation of exponents over time and when the variation exceeds a threshold, new exponents will be sent; section 8.2.8 page 103).

Regarding **Claims 9, 23 and 35** in addition to the elements stated regarding claims 1, 17 and 31, the combination further discloses:

wherein the neural network processing comprises a feature extraction stage in which said sequence of exponent sets is utilized to determine said second variations (Castelaz discloses a feature extraction stage that extracts certain features from the signal; col. 4 lines 60 - 61);

a weighted routing stage in which said second variations are weighted according to predetermined weighting values and routed to inputs of a first neural layer (i.e. Castelaz discloses each of the connections between the neurons contain weights; col. 5 lines 38 – 40; the signal is propagated through the NSP until an output is produced by the neurons in the output layer. In the "typical" neural net model, the learning algorithm will attempt to minimize the difference between the actual and the desired output by effecting a change in the synaptic weights between the neurons; col. 3 lines 35 - 41)

a selection stage in which an output of the first neural layer is selected and an output processing stage (Castelaz discloses next, the input signal will be advanced one step through the sampling circuit; col. 3 lines 42 - 43)

a coding strategy is assigned to said first exponent set based on said first variation and the output of said selection stage (Castelaz discloses and a changing set of inputs teaches the net to produce a single output response; col. 3 lines 25 – 26).

Regarding **Claims 10 and 24**, in addition to the elements stated above regarding claims 9 and 23, the combination further discloses:

wherein a coding strategy is assigned to at least one subsequent exponent set on the basis of the output of said selection stage (ATSC further discloses the differential exponents are combined into groups in the audio block and the grouping is done by one of three methods D15, D25 or D45 which are referred to as exponent strategies and the number of exponents in each group depends only on the exponent strategy; section 7.1.1 page 45)

Regarding **Claims 11 and 25**, in addition to the elements stated above regarding claims 10 and 24, the combination further discloses:

wherein the coding strategy assigned to the at least one subsequent exponent set is an exponent re-use strategy (ATSC further discloses that if the spectrum changes little over the 6 blocks in a frame the exponents will be reused for blocks 1 –5; section 8.28 page 103)

Regarding **Claim 17**, in addition to the elements stated above regarding claims 1, 2 and 3, the combination further discloses:

to determine the maximum number of exponent sets that are similar to a given exponent set (ATSC further discloses mapping exponential values for similar exponent sets; page 43 – 44).

Regarding **Claim 18**, in addition to the elements stated above regarding claim 17, the combination further discloses:

wherein each of the plurality of exponent coding strategies corresponds to different differential coding limits (i.e. ATSC further discloses the differential exponents are combined into groups in the audio block and the grouping is done by one of three methods D15, D25 or D45 which are referred to as exponent strategies and the number of exponents in each group depends only on the exponent strategy; section 7.1.1 page 45)

Regarding **Claim 19**, in addition to the elements stated above regarding claim 17, the combination further discloses:

selecting one of said subsequent exponent sets on the basis of said first variation and assigning an exponent re-use coding strategy to the selected exponent set and any exponent sets in said sequence between the first exponent set and the selected exponent set (ATSC further discloses that if the spectrum changes little over the 6 blocks in a frame the exponents will be reused for blocks 1 –5; section 8.28 page 103)

Regarding **Claim 20**, in addition to the elements stated above regarding claim 17, the combination further discloses:

determining a second variation of exponent values between consecutive exponents in said first exponent set (ATSC further discloses differential coding in which

the exponents for a channel are differentially coded across frequency and successive exponents are sent as differential values which must be added to the prior exponent value in order to form the next absolute value)

wherein the exponent coding strategy for said first exponent set is selected on the basis of said first and second variations (and the differential exponents are combined into groups in the audio block and the grouping is done by one of three methods D15, D25 or D45 which are referred to as exponent strategies; section 7.1 .1 page 45 of ATSC)

Regarding **Claims 31, 45 and 47**, in addition to the elements stated above regarding claims 1 – 6, ATSC discloses:

A digital audio encoder in which audio data in which audio data is transformed into coefficients having mantissas and exponents arranged in a sequence of sets (ATSC, entire document), comprising:

a first variation processor coupled to receive the exponents of sets from said sequence and to determine a first variation of exponent values between a first set and a plurality of subsequent sets in the sequence (i.e. for each audio channel, examining the variation in exponents over frequency and time; page 103);

a second variation processor coupled to receive the exponents of said first set and determine a second variation between consecutive exponent values within said first set (i.e. differential coding in which the exponents for a channel are differentially coded

across frequency and successive exponents are sent as differential values which must be added to the prior exponent value in order to form the next absolute value);

selecting and assigning an exponent coding strategy to said first set from a plurality of coding strategies on the basis of said first and second variations and a mean average difference calculation between consecutive exponent values (computed weighted sums) (i.e. it is then determined if strategies D15, D25 or D45 are used; and the differential exponents are combined into groups in the audio block and the grouping is done by one of three methods D15, D25 or 045 which are referred to as exponent strategies; section 7.1 .1 page 45)

a weighted routing stage in which said first variation values are weighted according to predetermined weighting values(i.e. when the variation exceeds a threshold, new exponents will be sent; page 103 8.28. To determine if the threshold is exceeded a difference calculation must be done. When calculating the difference between two elements for example B and A, B – A provides that result. B-A is mathematically equivalent to (1)B + (-1)A which includes weighted sums. Calculating this equation thus computes weighted sums.)

and an output processing stage in which the coding strategy is assigned to said first exponent set based on the output of said selection stage and said second variation (i.e. and the differential exponents are combined into groups in the audio block and the grouping is done by one of three methods D15, D25 or 045 which are referred to as exponent strategies; section 7.1 .1 page 45)

ATSC does not disclose a neural network processor comprising the first variation and second variation processors or the neural network processor is configured to select and assign the exponent strategy, the neural network processor includes a weighted routing stage and routed to inputs of a first neural layer, a selection stage in which an output of the first neural layer is selected.

Castelaz discloses a neural network signal processor that can receive and analyze raw audio data (col. 2 lines 38 - 47) and the neural signal processor comprises a layer of input processing units connected to other layers of similar neurons (col. 2 lines 49 - 50).

Modifying the encoder taught by ATSC to operate as a neural network as taught by Castelaz would create a neural network processor comprising the first variation and second variation processors or the neural network processor is configured to select and assign the exponent strategy, the neural network processor includes a weighted routing stage and routed to inputs of a first neural layer, a selection stage in which an output of the first neural layer is selected.

Multiple level processing such as neural network processing is notoriously well known in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the teachings of Castelaz to function as the determining process of ATSC. One would have been motivated to do so to reduce preprocessing required; see Castelaz col. 2 lines 30 – 35.

Regarding **Claim 32**, in addition to the elements stated above regarding claim 31, the combination further discloses:

wherein the exponent coding strategy is assigned from a plurality of exponent coding strategies having different differential coding limits (ATSC further discloses the differential exponents are combined into groups in the audio block and the grouping is done by one of three methods D15, D25 or D45 which are referred to as exponent strategies and the number of exponents in each group depends only on the exponent strategy; section 7.1.1 page 45)

Regarding **Claim 33**, in addition to the elements stated above regarding claim 31, the combination further discloses:

wherein the neural network processor also selects and assigns an exponent coding strategy to at least one of the subsequent steps (ATSC further discloses looking at the variation of exponents over time and when the variation exceeds a threshold, new exponents will be sent; section 8.2.8 page 103)

Regarding **Claim 34**, in addition to the elements stated above regarding claim 33, the combination further discloses:

wherein the exponent coding strategy assigned to the at least one subsequent sets is an exponent re-use strategy (ATSC further discloses that if the spectrum changes little over the 6 blocks in a frame the exponents will be reused for blocks 1 –5; section 8.28 page 103)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew C. Flanders whose telephone number is (571) 272-7516. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7546. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

acf

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SUPERVISORY PATENT EXAMINER